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THE COMMITTEE ON EDUCATIONAL RESEARCH

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Editorial

Action research is often hailed as a solvent of the time lag between the completion of formal research and its application in practice. This time lag, according Dr. Clarke's article in this issue, tends to be considerable. This may be because of delays in publication, difficulties of interpretation of highly condensed and perhaps technically statistical presentations, and the relative disinterest of educators. Action research, while suffering sometimes from the absence of rigidly scientific operational techniques, is done on the spot, and is done by the staff or its agent. Its results are immediately available, at least to the staff, its findings may be taken promptly into use, or further experimentation may be launched with improvements suggested by the first study. Mr. McGrath reports in subsequent pages a piece of action research done in Peace River on remedial reading in the intermediate grades.

Occasionally somewhat esoteric statistical devices must be employed to lay bare similarities or differences between variables under review. One such device is known as covariance, a special form of the correlation technique, and used to reduce the data from experiments involving two or more variables measured in several groups. This device is seen at once to be useful in the study reported by Dr. Dunlop and associates. The findings are certain to be of both interest and concern to everyone having to do with the use of school vans for transporting young children. The findings, though clear-cut, have been interpreted with admirable caution.

The Andrews study compares, as to subject matter characteristics (SMC), two types of teachers. They are first, those trained in teacher training colleges, and second, those trained for the most part in liberal arts faculties. The assumption is that the attitude or orientation toward the teaching profession, towards their work, might be different. This assumption is formulated in thirteen hypothesis to be either confirmed or disproven. The conclusions have many administrative implications. Whether these differences exist to any degree in Canadian schools is yet to be determined.

Dr. Byrne proposes six criteria for the evaluation of provincial leadership in the field of public education. Though the criteria have been drawn largely from the literature on leadership in the United States they have been shown in earlier papers of Dr. Byrne to be equally valid in Canadian practice. Despite differences in application, and differences in terminology, the structural principles of school administration are common to the two countries. As an exercise in the application of these criteria, Dr. Byrne relates them to educational leadership in Alberta.

THE INFLUENCE OF THE TIME SPENT IN SCHOOL BUSSES UPON ACHIEVEMENT AND ATTENDANCE OF PUPILS IN ALBERTA CONSOLIDATED SCHOOLS

G. M. DUNLOP, R. J. C. HARPER AND S. HUNKA

This investigation was sponsored and financed by the Alberta Advisory Committee on Educational Research and the school boards of the divisions concerned. It could not have been completed without the support and cooperation of school board members, superintendents, principals and teachers. Acknowledgment of this support is expressed, in token form, by listing the superintendents, who were, in fact, prime movers in the project, and the divisions with which they are associated.

Mr. G. F. Hollinshead, B.Sc., B.Ed.	Calgary School Division No. 41
Mr. M. Holman, B.Ed.	Wheatland School Division No. 40
Mr. E. H. Bliss, B.A., B.Ed.	Three Hills School Division No. 60
Mr. X. P. Crispo, B.A., M.A.	Olds School Division No. 31

The Problem

For many years Alberta has attempted to achieve a greater degree of equality of educational opportunity through large scale centralization of schools. As a consequence the traditional one room rural school has tended to disappear gradually, to be replaced by new well equipped and adequately staffed centrally located schools to which many of the pupils are transported by school busses or vans. During the school year of 1955-56 there were approximately 62,864 children transported a distance of 102,790 miles daily to centralized schools on 2,021 vehicles either owned by the school divisions or under contract to them.¹

Although centralization of schools results in many advantages to the pupils, there are certain hardships which may arise from the situation. One handicap is the fact that many children must spend long periods daily in school busses or vans being conveyed to and from their schools. Lambert² found that pupils who were transport-

¹Fifty-first Annual Report, Department of Education, Province of Alberta, Queen's Printer, 1957, p. 167.

²A. C. Lambert, "Length of School Day for Transported Pupils," *American School Board Journal* 99, (September, 1939), pp. 45-46.

ed to school in authorized vehicles experienced an appreciable lengthening of the school day.

Bonney³ discovered that vanned students were not accepted by their peers on an equal basis with town students, due, in part, to differences in socioeconomic and cultural backgrounds. Munro⁴ found a similar lack of acceptance of vanned high school pupils who, in turn, tended to develop into an 'out group' clique.

Lee⁵ has provided evidence suggesting that children transported to classes in a school vehicle show a greater degree of maladjustment than children who do not require transportation. He reports that boys show more disturbance of adjustment than girls. In explanation he advances the hypothesis that the observed maladjustment may spring from deprivation of maternal care which falls with greater severity upon the vanned children due to the extension of their daily period of absence from the home.

Little research has been published on the influence of time spent in being transported to and from school on academic achievement, attendance and health. This problem is of great importance in many of the Canadian provinces and in wide areas of the United States, since the answers to the questions it raises should affect policy of divisional and local boards and of the grant structure of provincial and state departments and offices of education.

The Design of the Study

In order to obtain an answer to the problem of the influence of time spent in school buses upon achievement it was decided to use control and experimental groups at the second, fourth and sixth grade levels. The experimental groups were drawn from children from rural homes who were daily vanned to central schools. The control groups were drawn from children who lived in the immediate vicinity of these schools and consequently did not require transportation. All children involved in the study lived in four rural divisions adjacent to the City of Calgary. Because of their limited numbers almost all the vanned pupils in the grades concerned were included in the experimental groups. The control groups were composed of all the pupils resident in the immediate vicinity of sufficient representative schools to bring the number into conformity with that of the experimental group. Thus, without recourse to more refined but less practical sampling procedures, it was hoped

³M. E. Bonney, "A Sociometric Study of the Peer Acceptance of Rural Students in Three Consolidated High Schools," *Journal of Educational Administration and Supervision* 33, (May, 1951), pp. 234-240.

⁴B. C. Munro, *The Structure and Motivation of An Adolescent Peer Group*. Unpublished M.Ed. Thesis, University of Alberta, 1957.

⁵T. Lee, "On the Relations Between the School Journey and Social and Emotional Adjustment in Rural Infant Children," *British Journal of Educational Psychology*, (June, 1957), pp. 101-114.

that the two samples at each grade level might be regarded as randomly selected and representative of the population of vanned and unvanned pupils of the four large divisions concerned. At each grade level both control and experimental groups originally numbered 200. The unusual mobility of the population in the current period of prosperity, over the fourteen months of the study, reduced sample size materially as is apparent in Table I.

TABLE I
FINAL SAMPLE SIZE OF CONTROL AND EXPERIMENTAL
GROUPS OF VANNED AND UNVANNED PUPILS IN
GRADES TWO, FOUR, AND SIX IN FOUR RURAL
SCHOOL DIVISIONS

Group	Vanned	Unvanned
Grade II	171	144
Grade IV	188	160
Grade VI	167	143

Both experimental and control groups were administered the Stanford Achievement Test, Form J, in January, 1956, and the comparable Form L, in April, 1957, using the level appropriate to the grade. In addition all pupils completed the Otis Quick-Scoring Test of Mental Ability suited to their grade levels. Relative gains in achievement at each grade level were computed for the vanned and unvanned groups. After the linearity of relationship of initial and final scores had been demonstrated, and the uniformity of the variances had been verified, an analysis of covariance was completed to determine whether any significant changes in level of achievement had developed during the intervening period.

The Factor of Intelligence

In order to assess intelligence as the causal factor in differences in achievement between control and experimental groups a test of the significance of differences in mean intelligence was used at the grade two, four and six levels, as reported in Table II.

This evidence suggests that differences in intelligence between control and experimental groups at the second, fourth and sixth grade levels are non-significant, and therefore intelligence cannot be used to explain the significant differences in achievement which later appear in this study.

The lack of significant differences in intelligence as between vanned and unvanned children is worthy of comment in view of the

TABLE II
COMPARISON OF MEAN INTELLIGENCE OF VANNED
AND UNVANNED PUPILS IN GRADES TWO, FOUR AND
SIX IN FOUR RURAL SCHOOL DIVISIONS

Group	N	Mean	S.D.	Difference	Significance
Grade II Vanned	157	103.204	12.524	1.938	Non-Sig.
Unvanned	127	105.142	13.575		
Grade IV Vanned	177	98.073	11.926	.301	Non-Sig.
Unvanned	152	98.375	12.725		
Grade VI Vanned	156	102.955	11.802	.082	Non-Sig.
Unvanned	134	103.037	10.680		

evidence presented in the fairly definitive Alberta Studies of Carmichael and Rees,⁶ Climenhaga,⁷ and Pritchard,⁸ which indicate that intelligence test scores of urban children are superior to those of pupils from rural areas. While it is true that the vanned children are rural dwellers, they do not suffer the handicaps and limitations of an exclusively rural environment, and, indeed, attend consolidated schools which do not fall far short of town and urban schools in staffing, equipment and size. As a complementary fact, the unvanned group of children live in the villages in which the centralized schools are located, an environment which is not materially superior to that of the vanned pupils with whom they are compared.

The Factor of Attendance

Just as differences in intelligence between vanned and unvanned groups might lead to misinterpretation of findings, so might also a differential in attendance of the two groups, at the different grade levels, lead to serious errors in understanding and interpretation. To forestall such error a study of attendance during the experimental period of fourteen months is reported in Table III.

⁶Anne Carmichael and Robert E. Rees, "A Survey of Reading Achievement in Alberta Schools," *The Alberta Journal of Educational Research* (March, 1955), pp. 18-33.

⁷Clarence E. Climenhaga, "A Survey of the Arithmetical Achievement of Grade Eight Pupils in Alberta Schools," *The Alberta Journal of Educational Research* (December, 1955), pp. 35-47.

⁸Ralph O. Pritchard, "A Survey of the Arithmetical Achievement of Grade Five Pupils in Alberta Schools," *The Alberta Journal of Educational Research* (March, 1956), pp. 41-48.

TABLE III

DIFFERENCES IN SCHOOL ATTENDANCE OF VANNED AND UNVANNED PUPILS IN GRADES TWO, FOUR AND SIX IN FOUR RURAL SCHOOL DIVISIONS

Group	Number	Attendance Means	S.D.	SE.	CR.	Significance of Differences
Grade II Vanned	171	256.59	11.17	1.366	1.69	Non-Sig.
Unvanned ...	144	254.28	12.80			
Grade IV Vanned	188	256.33	10.69	1.219	1.17	Non-Sig.
Unvanned ...	160	257.75	11.86			
Grade VI Vanned	167	256.74	9.97	1.066	3.57	Sig. .01
Unvanned ...	143	260.54	8.79			

The finding that there are no significant differences in attendance between the vanned and unvanned groups in grades two and four over a period of fourteen months is a comforting one, and a partial justification of centralized schools and of the vanning of rural pupils. The fact that there is a significant inferiority in attendance of vanned pupils at the grade six level obviously becomes intelligible only as an outcome of the pioneer practice of keeping older farm boys at home to help in seasonal activities such as seeding and harvesting. This finding aids us in understanding certain deviations in the pattern of achievement which will be reported later, and insures against gross misinterpretation of the findings.

TABLE IV

MEAN ACHIEVEMENT OF VANNED AND UNVANNED GROUPS IN GRADES TWO, FOUR AD SIX IN FOUR RURAL SCHOOL DIVISIONS

Group	Vanned		Unvanned	
	Test I	Test II	Test I	Test II
Grade II	26.029	39.053	25.653	40.479
Grade IV	46.628	59.410	44.000	57.013
Grade VI	63.222	78.066	64.091	78.252

The Influence of Vanning on Achievement

A summary of mean achievement on the initial tests, and on the final tests, which followed after fourteen months, appears in Table IV.

A cursory inspection reveals a superiority in rate of achievement of the unvanned over the vanned group at the grade two level. Tables V, VI and VII present a summary of the covariance analyses.

TABLE V
COVARIANCE SUMMARY OF ACHIEVEMENT OF 171
VANNED AND 144 UNVANNED GRADE TWO PUPILS⁹

Test	Property Tested	F Ratio	Significant Ratio		Result
			5%	1%	
F ₁	Difference between Groups —Adjusted for Individual Group Rate of Change	6.45	3.91	6.81	Sig. 5%
F ₂	Difference between Groups —Adjusted for Combined Groups Rate of Change	10.40	3.06	4.75	Sig. 1%
F ₃	Difference between Group Rates of Change	2.35	3.06	6.81	Not Sig.

TABLE VI
COVARIANCE SUMMARY OF ACHIEVEMENT OF 188
VANNED AND 160 UNVANNED GRADE FOUR PUPILS

Test	Property Tested	F Ratio	Significant Ratio		Result
			5%	1%	
F ₁	Difference between Groups —Adjusted for Individual Group Rate of Change	0.431	3.03	6.73	Not Sig.
F ₂	Difference between Groups —Adjusted for Combined Groups Rate of Change	0.823	3.87	4.68	Not Sig.
F ₃	Difference between Group Rates of Change	0.037	3.03	6.73	Not Sig.

⁹The procedure used for the analysis of covariance was adopted from J. F. Kenney and E. S. Keeping, *Mathematics of Statistics, Part Two*, D. Van Nostrand Co. Inc., Toronto, Ontario, 1953, p. 274.

TABLE VII
COVARIANCE SUMMARY OF ACHIEVEMENT OF 167
VANNED AND 143 UNVANNED GRADE SIX PUPILS

Test	Property Tested	F Ratio	Significant Ratio		Result
			5%	1%	
F ₁	Difference between Groups —Adjusted for Individual Group Rate of Change	0.552	3.87	6.73	Not Sig.
F ₂	Difference between Groups —Adjusted for Combined Groups Rate of Change	0.520	3.03	4.68	Not Sig.
F ₃	Difference between Group Rates of Change	0.584	3.87	6.73	Not Sig.

In the three summaries of covariance F₂ is the better test of the significance of the differences in achievement of the two groups since the variances used in F₂ are better estimates of the population variance.

In Table V the F₁ test reveals a difference in achievement in favor of the unvanned over the vanned group of grade two pupils at the .05 level of significance. Under the more effective F₂ test the difference favoring the unvanned pupils attains the .01 level of significance. This must be interpreted as meaning that the vanned group of 171 grade two pupils made significantly poorer progress than the unvanned group of 144 grade two children. This does not mean, however, that the lower achievement of the vanned children was attributable entirely to the harmful effects of time spent in school busses. It does mean that their progress was retarded by factors probably relating to rural life, among which must be listed the time spent in busses coming to and returning from school.

Tables VI and VII reveal no significant differences in achievement of the vanned and unvanned groups at the grade four and the grade six levels. Subject to limitations in sample size, and the fulfillment of the major assumption of the randomness of the samples, it would seem that the factor or factors producing inferiority of achievement in the vanned pupils in grade two cease to be effective at the grade four and grade six levels.

Summary of Findings

1. No significant differences in intelligence between vanned and unvanned pupils existed at the grade two, four or six levels.

2. Differences in attendance between vanned and unvanned pupils are not in evidence in grades two and four, but become significant to the disadvantage of the vanned group at the grade six level.
3. The vanned group of grade two children were significantly lower in achievement than the unvanned group. No significant differences in achievement were found at the grade four or the grade six level.

Expansion of Findings

1. The intelligence of children vanned from farm homes was not found to differ significantly from the intelligence of the unvanned children resident in the villages in which the centralized schools are located. This finding suggests that the modern rural home provides as rich an environment as does the village or market town, when educational opportunities are equal. This finding removes intelligence from consideration as a causal factor in the one case where differences in achievement of the vanned and unvanned groups of children occurred.
2. The inferiority of attendance of vanned children in grade six must be attributed to the practice of keeping older children at home to aid in seasonal farm operations. The absence of differences in attendance at the grade two and grade four levels probably supports the wisdom of the practice of vanning rural children to school since the effective system of school transport appreciably facilitates regular attendance.
3. The inferiority of achievement of the vanned group at the grade two level must be regarded as evidence discouraging the longer bus routes for children in the lower grades. Since no significant difference in achievement are apparent at the grade four and grade six levels it must be inferred that vanning is not injurious to the achievement of pupils in these grades.

Required Research

In the light of the evidence provided by this study, it is now possible to restate the problem in a manner which may provide guidance to future research workers. First of all, the time spent in a school bus daily is likely only a part of the longer and more exacting day of pupils who live on farms. If this is so the time spent on a school bus could be misleading when treated in isolation. It would seem that farm children may rise earlier, do chores around the farm or home, and walk to the point at which they catch the bus, with the process repeated in reverse in the late afternoon. This

would result in a day of extended length and effort as compared to the day of a child who lives in the vicinity of the school. If this is the case the total length of the day, and the nature of the activities engaged in would be more important as predictors of diminished achievement than the actual time spent in the school bus. The fact that inferiority in achievement is demonstrable only in the grade two vanned group suggests that the children of the first two or three grades lack the strength and endurance required to overcome the adverse effects upon academic achievement of their longer and more fatiguing day. The findings of Bonney, Munro, and Lee must also be reviewed since degree of acceptance and quality of adjustment appear important factors influencing the achievement of vanned pupils, although the influence of these factors is not apparent at the grade four and grade six levels.

Future research workers must attempt to measure additional variables such as length of waking day, tasks and chores performed about the farm and home, and distance walked to the point at which the school van is met, time in transit in the school bus, as well as the acceptance and adjustment of vanned pupils, if they are to predict more accurately the impairment of achievement which is anticipated.

Implications

For Educational Authorities

1. A significant impairment of academic achievement of children in grades one and two does exist in the sample studied. It apparently disappears before grade four.
2. This impairment seems due to a combination of factors: the lower strength and resistance to fatigue of the younger children, certainly, and probably the longer waking day of farm children; perhaps chores and tasks performed by these children, as well as the actual time in the school bus, and the time required to get to the point at which the bus stops for its passengers. The degree of acceptance of vanned pupils and the quality of their adjustment to the total situation may also be factors requiring consideration.
3. The evidence discourages lengthening of bus routes for children in the lower elementary school; time in bus is only one of the factors, however, accounting for the fatigue which results in diminished achievement. Parents and administrators must attempt to control the other factors suggested as contributing to the heavier school days of these children.

For Parents of Vanned Children

1. Children of the first three grades are likely to have reduced academic attainment as a result of various factors including the longer and heavier school day.
2. While it is true that long bus routes contribute to the length of the school day, parents can lighten it appreciably by insuring that their younger children:
 - (1) Have as much sleep as is practicable.
 - (2) Are released from chores and duties which extend their waking day.
 - (3) And are conveyed to the point at which the bus calls for them daily.

EVALUATIVE CRITERIA OF PROVINCIAL LEADERSHIP IN PUBLIC EDUCATION

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The purpose of this paper is to establish criteria for the evaluation of provincial leadership in the field of public education. The application of these criteria in an appraisal of the central administration of instruction within the Province of Alberta is reviewed briefly in the second section which summarizes a study on the provincial administration of high school instruction.¹ The data providing the basis for this study were drawn from the records of central leadership in education over the first fifty years of Alberta's history.

I. Evaluative Criteria

"A plan whether for a state, for an apartment house, or for advanced education is the product of applied criteria."² Criteria are, in effect, principles growing from the field of theory and practice that serve to crystallize current thinking and to provide guides for action. One major purpose in evaluating present practice is to discover the need for change and the direction it should take. Criteria should establish guiding principles useful for long range planning which, at the same time, recognize the immediate problems presented by legality and tradition in making this planning effective. To that extent a criterion should be an expression of common sense.

The criteria outlined here have been drawn largely from the literature on state leadership in the United States. Their applicability to central leadership in the Canadian provinces has been validated by reference to a comparative study of design and structure in the public school systems of the two nations. The conclusion reached through this study was that, while administrative structures differed in accordance with constitutional practice, the conceptual designs of the national systems were similar.³ This implies a common set of values directing the course of public education, a similar allocation of constitutional responsibility, and a pattern of relationships between central and local governing agencies bearing marked

¹T. C. Byrne, "The Historical Development and an Evaluation of Provincial Leadership in the Field of High School Instruction for the Province of Alberta," unpublished Doctoral Dissertation, University of Colorado, 1956.

²Russel V. Black, "Criteria and Planning of Public Works," *Federal Emergency and Administration of Public Works, National Planning Board*, p. 27.

³T. C. Byrne, "Design and Structure in Canadian Education," *The Alberta Journal of Educational Research*, Vol. III, No. 1 (March, 1957), pp. 28.-43.

resemblances. Organization and practices in central administration differed, but the basic concepts in design reflected similar historical and environmental influences.

The six criteria developed in this study may be classified into two broad aspects of administration. The first criterion is regulatory in effect and is related to the inspection services of the central department. The remaining five reflect the leadership or service aspects of central administration.

Reference is made throughout this paper to the total administrative process involved in the provincial administration of instruction. Sears, in an analysis of this process, enumerates its phases as planning, organizing, directing, co-ordinating and controlling, each of which he defines in an attempt to clarify the problems of administration by local and central agencies of school government⁴. According to Sears, planning involves preparation for action and is an essential part of action itself, so that it interacts with direction, organization, co-ordination, and control. The organization is the machine for doing work which may be composed primarily of persons, but also of materials, ideas, concepts, forms, rules, principles, or a combination of these. Direction represents authority at work exercised by individuals, by knowledge and by social forces. Co-ordination seeks to move all parts of the complex system, including many purposes, processes, people, and things, together in harmony to achieve a unity of effort. And finally, control provides the means by which the action is directed through force or by law, policies, regulations, instructions and plans, or by tradition, customs or professional ethics. These phases of administration contribute to, and are part of, the all-embracing process by which the constitutional authority vested in the legislative assembly is made effective in the schools of the province.

1. *The province should established through its administration a minimum or basic school program*

This criterion implies that a province (or state) should require all public school systems within its borders to reach a pre-defined adequate standard in public education, a power which this unit of government possesses by constitutional right. That provincial legislatures have been granted this authority reflects an acceptance by society generally that an educated citizenry is essential to national well being. One statutory effort to assure this resides in the compulsory attendance law now almost universal in school legislation.⁵ In giving effect to a compulsory attendance law, the legislature must insure that the instructional program justifies its legal imposition.

⁴Jesse B. Sears, *The Nature of the Administrative Process*, p. 32.

⁵Fred F. Beach, *The Functions of the State Department of Education*, p. 11.

Furthermore, the province's complete responsibility for all public education points up the need to be concerned with a foundation program throughout the entire school period.

The establishment and maintenance of a minimum program is, therefore, a regulatory function of primary importance in central leadership and one which the executive arm of government cannot avoid.⁶ The method of its development through adequate instructional service is a problem of such complexity that no simple solution will provide an answer. One major difficulty in setting forth the foundation program resides in the fact that planning frequently results in quantitative rather than qualitative demands. Despite this, efforts to guarantee basic education to all citizens remains a valid, though complicated, governmental concern. Furthermore, the essentials of this program should not be static but should be reviewed as general understanding of the educative process grows and as the public's capacity and willingness to grant financial support increases.

While a corollary to the central regulation of basic education should be financial aid to those districts unable to provide the minimum in educational service, provincial or state responsibility cannot be limited to monetary grants on the assumption that these alone will guarantee adequate education. From researches in the State of Connecticut, Chase and Switzer concluded that "A high level of financial support makes possible but does not assure an effective educational program."⁷ The central authority cannot abdicate from its exercise of both regulatory and leadership functions which are to maintain a minimum educational program and to create a vigorous system of public education. A foundation program does not necessarily mean uniformity in educational achievement.⁸

2. *The central department should exercise leadership through over-all planning in public education*

The need for central planning by individuals or committees grows from the general character of school law which provides authority but does not specify methods for making it effective. The intent of a general law is that authority should be held in abeyance until science and philosophy have been applied in the specifics of planning.⁹ The development of detailed legislation by provincial or state legislatures governing the conduct of schools fails to recognize two significant influences creating needs for flexibility in the application of school law: that cultural change in society is in-

⁶American Association of School Administration, "The American School Superintendency," 30th Yearbook, p. 396.

⁷Frances Chase and Robert Switzer, "State Governments and Education," *Review of Educational Research*, No. 4 (Oct., 1952), p. 346.

⁸Beach, *op. cit.*, p. 12.

⁹Sears, *op. cit.*, pp. 43-50.

evitable, and that research is continually adding to our knowledge of more effective procedures in education.¹⁰ The planning function of the central department derives from the problem of interpreting the general law authorizing the operation of a province-wide system of schools in terms of current needs and evolving theory.

Co-ordination as a phase of the administrative process in public education should be exercised by provincial departments through broad planning for instructional improvement at the school level. Chiara, in a study of the curriculum programs of forty-eight states, concluded that state leadership was needed in "identifying and resolving problems confronting education so as to facilitate curriculum improvement."¹¹ The state or province is an entity in cultural growth and, as such, has problems common to all school systems and unique to its developing culture. Long range planning in terms of social and economic trends requires a breadth of experience with the total school system as well as a vision in provincial development which the central department alone possesses.

Planning in the administrative process implies control, but the control associated with central planning should be largely moral and persuasive rather than regulatory, the purpose being to stimulate local growth through the broader vision of central leadership. Provincial planning followed by directives tends to destroy or prevent the partnership in instructional improvement between central and local authorities which is essential for its success. Authority flows downward from central to local government but the delegation of power must be a genuine transfer with mutual understanding of its obligations and limitations.¹²

Provincial planning should involve professional and lay people widely. Local systems should be called upon to participate in planning so that communication becomes a two way process with the provincial department providing both direction and focus in policy growth. Central planning should be open ended and continuous. Recognizing that curriculum development is an ongoing process, the planning leadership of the provincial department should be equally flexible in its sensitivity to the changing nature of modern society.

3. *The central authority should grant freedom to and encourage the local school and community to plan and adjust school programs to meet local needs*¹³

This criterion recognizes that a major share in the planning of

¹⁰Ibid.

¹¹Clara Chiara, "A Critical Study of the Secondary School Curriculum Programs of the State Department of Education," Unpublished Doctoral Study, Columbus, Ohio State University, 1958, p. 465, cited by Chaser and Switzer, *op. cit.*, p. 347.

¹²Sears, *op. cit.*, p. 277.

¹³William Alexander, *State Leadership in Improving Instruction*, p. 33.

school programs should take place at the centre of action in the educational system, and that those who execute the plans will do so more effectively if they are part of the planning process.¹⁴ The criterion derives from the thesis that the school's curriculum is essentially experiential and that the teacher is the most important agent in the development of effective learning experiences.¹⁵ It reflects, further, the assumption that instructional improvement takes place only as those most directly concerned acquire new perceptions of the professional task.¹⁶

The close relationship of curriculum and supervision is recognized in this evaluatory principle. Supervision vitalized by curriculum study operates most effectively through the inservice education program which is primarily developed through local leadership.¹⁷ Planning for instructional improvement offers a challenge that affords rich opportunities for professional growth, a basic condition for which is freedom to make decisions on the basis of the best available evidence.

Granting freedom to local authorities in the development of curriculum does not preclude or lessen the importance of planning at the provincial level. The province cannot avoid responsibility centrally nor disregard failure locally to achieve a foundation program of education. Methods of exercising leadership will differ, however, according to purposes.

Failure to recognize the criterion results when provincial legislatures enact legislation directing with considerable specificity what should be taught in the schools. It is transgressed by central departments that issue prescriptive courses of studies crystallizing the major share of planning prior to and apart from the learning situation. The tradition of prescription frequently lingers on long after central departments have ceased to publish specific directives, pointing up one major problem associated with any move to decentralize curriculum planning and control. Provincial officials concerned with developing broad professional competence among school personnel should actively encourage teachers and administrators to participate in local curriculum studies.

4. *The province (or state) should exercise leadership through a co-ordination of different phases of the instructional program and of the efforts of local school systems*

Co-ordination is an important aspect of the administrative process; it is really, however, an entirely separate activity.¹⁸ Co-

¹⁴Sears, *op. cit.*, p. 72.

¹⁵Harold Alberty, *Reorganizing the High School Curriculum*, p. 523.

¹⁶Alice Miel, *Changing the Curriculum, a Social Process*, p. 10.

¹⁷Harold Spears, *The Teacher and Curriculum Planning*, p. 116.

¹⁸Sears, *op. cit.*, p. 197.

ordination is involved in planning; it is also a part of organization and control. Planning loses its effectiveness through a lack of co-ordination if different aspects of the school program are planned in isolation. Co-ordination may be defined as the process which fits the various parts of the school system together, welding them into a functioning whole. It can be achieved best by a leadership that keeps the central purpose of public education in sharp focus before the diverse groups that contribute special competencies in different areas of the school program.

The importance of co-ordination in state school administration has been stressed by Grace in this quotation, "This development of an adequate educational program is contingent on the willingness of (the) many integral parts of our system to work as a unit."¹⁹ Central departments have, of course, problems of co-ordination much wider than those bearing directly on instruction, such as those concerning buildings, transportation, budgeting, and pupil accounting. Within the instructional field the relationship of guidance to teaching, of audio-visual education to the curriculum process, of in-service training to curriculum development, are illustrative of pertinent problems of co-ordination. Co-ordination may be vertical, this is, concerned with articulation of elementary and high school programs. It may be horizontal in its attempt to relate all factors bearing on classroom instruction at a given grade level.

The provincial department may exercise leadership through the co-ordination of the efforts of various school systems by serving as a medium through which local officials may share experiences in the administration and supervision of instructional programs. Stimulating and guiding local experimentation and disseminating information as to its success are co-ordinating services that a central department can best perform.

Co-ordination grows from the application of sound principles of organization in the structures of the central department. In order to co-ordinate supervisory and curriculum services, these should be in one department, under a common leadership dealing with the broad problems of instructional improvement at the provincial level. Vocational and general education should be the exclusive responsibility of one central board of education rather than a divided responsibility between two governing authorities as is the case in some of the United States. The principle of organization by function is the one most applicable to the internal structures of provincial departments.

¹⁹Alonzo Grace, "Planning Functions of State Departments of Education," *School Executive* LII (February, 1944), pp. 47-48.

5. *The province should provide direct services to local school systems in the development of instructional programs*

The services to which this criterion refers are those involving direct assistance through materials and personnel to local agencies, for instructional improvement. While the maintenance of the minimum program is one concern of these services, their major aim should be the continuous improvement of instruction in provincial classrooms. Services can be, however, an important aspect of central control, by providing assistance to school systems in planning and in translating plans into action.

The service function is becoming one of major concern to authorities in the field of central leadership. Under its broad definition Grace would include such services as identifying problems and issues, providing a centre for information, developing curriculum guides, and directing programs of evaluation and experimentation.²⁰ The National Council of Chief State Officers suggests that all services should be planned to encourage local interest in responsibility for policies and projects in educational improvement.²¹

The provincial department should provide services in the form of written materials. Curriculum guides which represent crystallization in central planning are invaluable aids in the development of the educational program locally. Other curriculum materials both visual and auditory may come within the service areas of central departments as films, radio and television programs, and correspondence courses. Publications that assist local systems in curriculum studies are probably one of the more effective contributions of province-wide services.

The central department should provide personnel to serve as consultants to local systems in their curriculum development and in-service education programs. That this type of advisory service has been recognized as useful by central departments in the United States is reflected in the following quotation from Cocking and Gilmore, "State departments have developed techniques of co-operation through providing advice and information to local administrators."²² In answer to an inquiry included in a recent survey as to the most useful service rendered by their supervisory staff, chief state executive officers replied "to assume leadership for the proper building of curriculum and to advance ideas and execute plans to insure more progressive programs of work."²³

²⁰Alonzo Grace, "Instructional and Curriculum Services," *School Executive*, LXVI (July, 1957), pp. 46-47.

²¹National Council of Chief State School Officers, *Our System of Education*, p. 21.

²²Walter Cocking and C. H. Gilmore, "Organization and Administration of Public Education," p. 122.

²³Association for Curriculum and Supervision, "Leadership through Supervision," 1946 Yearbook, p. 49.

6. *The provincial department should exercise leadership in the field of research*

"Democracy governs by authority, knowledge, and good will through a united staff, an informed and purposeful team."²⁴ Control results from a co-ordination of functions, from an "interweaving of experience", of those concerned with the total educational task and, as such, becomes a self-generating process resulting in collective self-control. Knowledge and understanding are basic to the smooth operation of the complex organization translating school law into practice. The development of this knowledge is the role of research.

Research is essentially a staff function of service in several phases of the administrative process. Planning is dependent on research; in effect, research is the core of planning.²⁵ Organization and modifications in the organizational structure should develop from the objective and carefully developed study implied by research procedures.

To separate research from action is a misapplication of the division of labor principle that occurs when research is the exclusive function of the college or university.²⁶ The central department should evaluate research findings, converting them into products meaningful to teachers and school administrators and useful for the improvement of instruction.²⁷ In this sense the provincial department acts as a clearing house for all types and kinds of research developed by universities, institutes, and local school systems.

The provincial department should operate a bureau of research to secure objective evidence for the solution of problems within the provincial system. This enterprise recognizes the close relationship between research and the educational task and the need for a continuous study of the problems of instructional improvement. The co-ordination of research throughout the province and the stimulation of local systems to engage in research would be a legitimate function of this bureau.²⁸ An important contribution of central leadership can result from the establishment of pilot studies among a small group of schools which may serve to stimulate improvement throughout the entire system.

²⁴Sears, *op. cit.*, p. 300.

²⁵Beach, *op. cit.*, p. 4.

²⁶Sears, *op. cit.*, p. 290.

²⁷E. L. Lindman, "Research Service on the State Level," *School Executive*, LXVI (July, 1957), p. 48.

²⁸Lawler and Lawler, "State School Organization and Administration," *Review of Educational Research*, XIX, No IV. (Oct. 1949), p. 344.

II. Application of Criteria to Provincial Leadership in Secondary Education in the Province of Alberta

The data for this phase of the study under review were drawn from the records of provincial leadership in secondary education over a fifty-year period. The sources of data were the annual reports of the Department of Education, sessional papers recording the planning of government commissions, and other pertinent documents. A summary of the data organized under the different phases of the administrative process is included in this section of the paper. The conclusions reached through an analysis of the data in terms of the criteria from a part of this review as well.

Planning

The readiness and capacity of the provincial Department of Education for leadership through curriculum planning was demonstrated early in the history of the province. Three major revision periods, along with the continuous study carried out over the past ten years, mark the planning stages of the present high school program. Provincial planning has been characterized by continuity reflecting, in its development, the changing needs of the province, the influence of educational theory, and the effects of administrative experience within the Alberta high school system. Moving from a strictly academic high school program, planned through the first revision in 1912, the second committee in 1924 broadened its scope to include six distinct curricula. The third committee in 1939 swung the course of high school education back to a common curriculum having a wide range of electives within its framework to provide for both special and general interests, permitting, in theory at least, individualized student programming. Recent planning by contemporary committees has modified the reorganization of the provincial group responsible for the third revision, but has made no major alterations in the high school curriculum.

The influences on planning have been analyzed in the study to discover more fully the nature of the planning process. Because of the close political control over education typical of Canadian provinces, the relationships between party interests and educational leadership were reviewed. It was concluded that the development of provincial school policy has been marked by continuity and non-partisanship irrespective of Alberta's changing and turbulent political history. The influence of the University of Alberta on high school education, exercised through the external examination and through prerequisite courses for matriculation standing, has been noted. The co-ordination of lay and professional thinking in the planning of provincial groups since 1918 is revealed in the documentary records of the province's educational history.

While the major emphasis has been on the structures, processes, and products of central planning, the study explored the products of local planning and the problems associated with stimulating local creativity in planning at the school or district level. The technical education and guidance movement, and the organization of composite high schools illustrate worthwhile adaptations that were the fruits of local invention. That central planners have recognized the need for a sharing of planning responsibility with local school authorities is apparent in the various attempts by provincial curriculum committees to stimulate local initiative since 1922, all of which have proved relatively ineffective. The predominant role assumed by the provincial authority early in Canadian history, in planning, organizing, directing, co-ordinating, and controlling instructional programs tends to limit local administrative efforts to the externals of the high school system.

Organization

The present structures for central planning have evolved from provincial experience in the exercise of leadership during the first half of the twentieth century. The provincial committee having a curriculum or program building orientation, with a membership including both lay and professional personnel and chaired by a departmental official, had become a typical planning structure by 1922. The internal organization of the Department of Education along functional lines, facilitating thereby committee study and providing for continuous leadership to curriculum development, had taken shape by 1919 with the appointment of the Supervisor of Schools who was, in effect, a curriculum director. The division between planning and control, that is between the curriculum and inspection services, was achieved by the separation of these two functions into distinct branches in 1919. The need for their co-operation, realized more fully through the influence of educational theory stressing the close relationships between curriculum and supervision, was recognized and met by the establishment of a common leadership over the two branches in 1945.

Direction and Control

The distinction between these two phases of the administrative process is not easily drawn, as an instrument of control also provides direction for the flow of authority from legislature to school. The exercise of central control has evidenced itself through the employment of prescriptive courses of study and provincial textbook authorizations. The external examination served as the major administrative device for maintaining the minimum program until 1936 when a limited type of local autonomy was introduced for

Grades X and XI. Since this time Departmental control over promotions has been exercised in the terminal year only, and largely for university entrance purposes. School inspection maintained its regulatory emphasis until 1935 at which time the act reorganizing local school government altered the relationship of the public school inspector to the local authority in the direction of service or leadership.²⁹ The high school inspector still performs both regulatory and service functions through his advisory role to superintendents and school boards.

Criterion One (Maintenance of minimum program)

On this criterion the efforts of provincial leadership rank high. The province has not only defined and planned the minimum or foundation program but it has developed, as well, through regulation and inspection, effective media of control for its establishment and maintenance. In the dimension of breadth the province has regulated the basic program for small schools at the same time providing desirable direction for expansion within the curriculum for larger centers. In the dimension of depth, as applied to specific subjects, provincial leadership has been effective in developing a foundation program which, however, tends to restrict rather than encourage local planning for instructional improvement.

Criterion Two (Leadership in overall planning)

The conclusion is that provincial leadership rates adequately on the planning criterion. It has been characterized throughout by a readiness to accept responsibility for planning, by direct assistance to local units, by an involvement of lay citizens in the planning process and by an adaptability to changing needs within the provincial system. If weaknesses exist, they result from the highly centralized character of provincial planning which fails to encourage or develop a province wide participation in the planning process. This defect is related to the evaluation of provincial leadership under criterion three.

Criterion Three (Encouragement of local initiative in planning)

Provincial leadership cannot be rated high on this criterion. Considerable freedom of decision exists locally with respect to the breadth of program. Once these decisions have been made, however, the local unit operates within the scope of strong central direction and control on all matters pertaining to specific courses. This has the effect of separating planning for instructional improvement from the point of action, the school itself, creating habits of dependence on the central authority which frequently militate against the development of local initiative in the solution of instructional problems.

²⁹Statutes of Alberta 1936, C85, Sec's. 274c.

Criterion Four (Leadership through co-ordination)

Generally provincial leadership ranks high on this criterion, the effectiveness of the co-ordinating function being enhanced through the careful planning, clearly defined direction, and adequate controls that characterize the administrative process of the province. Structures are developing for the co-ordination of local efforts in the improvement of instruction, the full value of which can only be achieved through the stimulation of local initiative in planning activities. The problem here is to distinguish between the co-ordination and control of local planning, in order to avoid a type of co-ordination that verges on direction militating thereby against the development of genuine local creativity.

Criterion Five (Provision of service)

Provincial leadership ranks high when evaluated by the criterion of adequacy of service to local school units, the variety of services rendered and personnel provided giving support to this conclusion.

Criterion Six (Development of research)

Provincial leadership when evaluated by this criterion must be rated inadequate. The province has not had, nor does yet have, a research service engaged in the development of the knowledge necessary for the most effective planning and co-ordination, and for a more informed type of administrative control.

III. Summary and Conclusions

1. The provincial Department of Education should perform the following functions in order to meet the criteria for effective instructional leadership outlined in this study:
 - (i) Plan, and maintain the foundation or minimum program.
 - (ii) Provide for over-all long range educational planning.
 - (iii) Stimulate and encourage local creativity in planning.
 - (iv) Co-ordinate the administration of the instructional program for schools within the province.
 - (v) Provide necessary services to local school units.
 - (vi) Establish and maintain a program of educational research.
2. In its record of instructional administration the Alberta Department of Education rates high on the first, second, fourth and fifth criteria. The Department has maintained a foundation program, planning effectively at the provincial level, co-ordinated the many facets of educational administration, and provided extensive curriculum and supervisory services.

3. The Department has not yet discovered the most effective methods of decentralizing planning to achieve local initiative and creativity within the provincial system. This remains a major problem for central leadership.
4. The Department has not yet established a bureau of research.

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PUPILS AND TEACHERS LEARN TOGETHER

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Action research has been defined as “a cooperative attempt by a group of practitioners to clarify objectives and improve practice by accumulating and evaluating pertinent evidence as they carry on daily tasks”.

In our case the practitioners were six teachers, and their daily task was to guide and promote the educational growth of one hundred and forty-one (junior high school) pupils. The teachers had various backgrounds of experience and years of training. Classroom experience ranged from none to six years, while years of University study ranged from one to four. Only two of the group had previous experience in grades where reading is usually taught as such. However, they had something in common, the interest of the pupils and the desire to do a good job.

The Problem

During the month of June, as regular procedure, the Sangren-Woody Reading Test had been administered to the pupils of grades 6, 7, and 8. The results showed that 38.8% of the children were reading below grade level—some by as much as three and one-half years. Of those who were entering grade nine, 56.1% appeared to be deficient in the necessary skill. The teachers felt that there was a need for some form of remedial reading for these pupils and tentative plans were then discussed.

Early in September the teachers met with the principal. The new members of the staff were apprised of the situation and after some discussion it was decided that the problem was really two-fold:

- (1) A large percentage of the junior high pupils were reading below their grade levels.
- (2) The teachers and principal had very little knowledge of corrective measures that might be taken.

The teachers agreed, however, to study the subject and tackle the job, for better or worse. The principal agreed to obtain books, equipment, and supplies, and a project was launched.

Procedure

The grade seven pupils were divided into two groups and the grades eight and nine pupils were divided into four groups according to their rating on the June test. The following groups were formed:

Grade	Group	No. of Pupils	Reading Level
VII	A	28	7.8 to 10.1
	B	28	5.3 to 7.7
VIII and IX	C	27	9.1 to 10.1
	D	17	8.1 to 9.0
	E	22	7.1 to 8.0
	F	19	4.6 to 7.0

The two groups of grade VII pupils met as separate classes for five periods a week from September to the end of February. During this time the groups formed from the pupils of grades VIII and IX met for two periods each week. For the superior groups, A and C, emphasis was placed upon literature and free reading, while the remaining groups were given a remedial reading program.

During the first week of the project the California Achievement Test (AA) was administered to all pupils for two purposes. First, it was hoped, from the study of the various sections of the test, to be able to determine specific areas of weakness and individual differences. It is to be admitted, however, that little use was made of individual diagnosis because of lack of experience in this field. The second objective was to establish a bench mark against which the value of the remedial program might be measured by using the alternative (BB) form of test at a later date.

Remedial measures varied from group to group and were by necessity largely trial and error. Many devices—flash-cards, rate-meter and eye-span trainer—were used. Reading exercises were taken from several sources and many books of high interest—low reading level were used.* Ideas grew out of individual study and group discussion. Help was received from the Superintendent, from primary teachers; and the Fall Convention, having for a theme, "The Teaching of Reading", brought expert advice and encouragement.

As the program progressed the principal was given the opportunity to observe lessons as carried out by individual teachers and several staff meetings were devoted to discussion of methods and assessment of results. Out of the many individual suggestions and experiments there grew a procedure that was carried out, with slight variation, by the teachers in charge of the four groups of low reading ability.

Lessons began with some form of flash-card drill in an attempt to increase eye-span and to make the pupils aware of this need.

*Mr. M. O. Edwardh, Assistant Director of Curriculum, has prepared "A List of Books for Reluctant Readers". This may be obtained, on request, from the Alberta Department of Education, Edmonton.

There being only one eye-span trainer available, two teachers made use of a window blind, an improvised trainor, but one clearly visible to the whole class. An opening was cut in the blind to expose a word or phrase when the blind was released. This worked in a manner similar to that of the device produced for individual use.

Part of the time allowed for each lesson was spent on word analysis and phonics followed by exercises designed to increase vocabulary and strengthen comprehension. Time for this work varied according to the need of the group. Groups E and D were given more experience in reading different types of material for more definite purposes. That is, exercises were used to develop skills such as skimming, reading for retention, and reading to find the main thought.

The latter part of each period was given to free reading. With the exception of groups B and F, grade level books were used. Every effort was made by the teachers to stimulate interest and to encourage the pupils to read for pleasure. Many books of high interest and low reading level were obtained and used with the lower groups. The teachers were lavish in their praise of these books. One teacher reported that she was having difficulty in supplying the demand from pupils who had previously shown no interest in reading. It was further felt that this type of material might form the core of a future remedial reading course.

Only one rateometer was available, but during the course of the project, sixty pupils volunteered to use the machine for fifteen minutes a day for a period of one month. Testing, at the end of this period, showed increases in rate of reading ranging from seventy-five to one hundred and fifty words per minute. Later testing indicated that much of the gain was not retained, due, possibly to the lack of long term motivation and transfer of technique to every day reading. However, it was felt that this machine could be of real value if its use could be given more thought and planning.

Little mention has been made of the two superior groups. Some time was spent with exercises designed to overcome weaknesses in vocabulary, as indicated in initial testing, but, as previously stated, their program was largely in the field of literature—prose and poetry. In an effort to develop deeper understanding and greater appreciation, selections were studied in some detail. Stories were studied for structure—plot, characterization, description and detail. Consideration was given to the various types of prose, such as the narrative, the essay, the radio play, and the news story. The study of poetry was done in much the same manner, emphasis being placed on the purpose of poetry, expression of feeling, rather than on techniques. The works of several poets were studied for style,

rhythm, and figurative language. The pupils were encouraged to write and were given ample opportunity for self-expression with some very pleasing results. The teachers found these groups a pleasure to work with, because they felt that the entire group was reached by each lesson, whereas, in an ordinary class, with a reading range from 5.1 to 10.1, teaching would be directed to the average, held at a much lower level, and differently approached.

Results

Testing all the pupils with Form (BB) of the California Achievement test, after a period of five months, showed an average growth in reading of 6.75 months, or 1.75 months above the expected normal growth. Considering the groups separately, the following results were observed:

Grade	Group	Av. Growth in Months	Ranges of Growth in months
VII	A	7.3	0-16
	B	9.5	1-18
VIII and IX	C	3.1	0-14
	D	9.1	0-21
	E	5.3	0-15
	F	6.3	0-16

As groups A and C were given very little in the way of remedial work it was of interest to note that when these groups were excluded from the calculations the average growth became 7:55 months. From still further analysis of the original data it was found that when only the pupils who were reading below grade level in September were considered, the average growth was 8.16. Here the greatest average growth, of 9.7 months, occurred with the pupils of grade VII, who had had five periods a week, while the pupils of grade VIII and IX with two periods a week, obtained average growths of 7.9 months and 6.9 months respectively.

It is interesting to compare the reading results with the results in other courses obtained by the grade IX students on the Departmental Examinations in June. The following tabulation gives the percentage of students obtaining the various gradings in each subject written:

Standing	Reading	Lit.	S.S.	Lang.	Math.	Sc.
H	6.1%	0 %	2 %	0 %	2 %	0 %
A	20.4	12.2	12.2	14.2	18.3	6.1
B	36.6	42.6	40.5	38.4	32.2	38.4
C	28.5	30.5	28.5	38.4	36.6	28.5
D	6.1	14.2	18.3	6.1	10.2	22.4

The above suggests that instruction in reading improves reading, and that acquired skills do not necessarily carry over into specific fields where reading is important.

Conclusions

The first question was, "Did the students gain from the project?" There was unanimous agreement in the affirmative. It was felt that there was evidence that:

- (1) There had been an over all improvement in reading ability.
- (2) The improvement in reading was greatest where the need was greatest—among those pupils who were reading below their grade level.
- (3) There had been increased interest in reading for pleasure.
- (4) Many pupils had come to realize that there were ways and means of improving the various skills needed for reading.

During the final evaluataion it became apparent that the project had produced a valuable by-product—the professional growth of principal and teachers. It was quickly agreed that much more could have been accomplished if fore-sight had been as keen as hind-sight. For a future effort of this nature the following suggestions for improvement were noted:

- (1) Remedial measures should be based on more professional diagnosis of individual difficulties.
- (2) The results of I.Q. testing should be known and considered along with diagnosis and assessment.
- (3) Parents should be made aware of the need, and of measures being taken. Their cooperation should be solicited.
- (4) There should be provision for pupils to move from one group to another as progress warrants.
- (5) A much wider use should be made of the books prepared for the reluctant reader.
- (6) Provision should be made for pupil self-evaluation. Motivation is high when progress is evident.
- (7) More attention should be given to critical reading and reading in specific areas.

Although the fore-going might be thought of in terms of negative results or learning through mistakes, there was also professional teacher growth in a positive sense. There was obvious gain for each individual in knowledge of, and facility in, teaching techniques. A

deeper appreciation of the value of cooperative effort was developed and possibly for the first time the principal and teacher felt at ease working together in the classroom. Individuals gained in confidence as each week brought a greater sense of worthwhile achievement. Enthusiasm was contagious. It spread from teacher to teacher and from teacher to pupils. It was discovered that pupils were willing to accept instruction apparently much below their grade level if they knew the reason and could see progress. There was improvement in the general tone and attitude of the entire school.

It was agreed that,

- (1) The teaching of reading should not stop with the elementary school.
- (2) The junior high school has an obligation to both the weak and the strong reader as each can improve under proper guidance.
- (3) A similar program should be carried out during the following year.

Ironically enough, when September came only one of the seven teachers returned to the same school, the others having gone their separate ways. The one remaining, however, in his new role of vice-principal, is initiating a revised reading project.

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ADMINISTRATIVE SIGNIFICANCE OF PSYCHOLOGICAL DIFFERENCES BETWEEN SECONDARY TEACHERS OF DIFFERENT SUBJECT MATTER FIELDS*

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A. *The Problem and Hypotheses*

Relationships among school personnel as they impinge upon the conduct of the school as an enterprise have received much attention in educational administration. Studies in leadership, morale, role relationships, and informal organization have thrown light directly or indirectly upon the importance of shared purpose and upon the possibilities of increasing it in the interests of more effectively accomplishing the aims of the schools.

Many studies in sociology and psychology indicate that one factor of importance in the increase of shared purpose is the similarity and difference of values and attitudes within the work group. Attempts have been made to relate some of the many variables in the school situation (such as teaching effectiveness) to value and attitude differences, but, in general, the patterns of occurrence of these differences remain unclassified and unpredictable.

Recent findings indicate, however, that the subject matter field of teachers may be a useful basis of classification for patterns of differences in personality needs, values, and attitudes. The problem of this study is to detect difference between subject matter groups of teachers in needs, values, and attitudes; to account for these differences; and to determine whether or not they are related to variables which have administrative significance. The discovery of differences is a matter of straight empirical investigation. The later two parts of the problem, however, require theoretical analysis in order to formulate the hypothetical statements of relationships which are to be tested.

Since most theory of attitude and value formation centers heavily around the influence of reference groups, the explanation of differences in values and attitudes is drawn from this source. Personality needs are similarly involved except that instead of resulting from the influence of reference groups, they are factors in the selection of the reference groups.

*Abstract of a study of the same title, sponsored financially by the Midwest Administration Center.

A high school teacher is seen to be subject to the influence of two important reference groups. These are the subject matter reference group and the teacher reference group. The former is the actual or idealized group consisting of former subject matter colleagues and college teachers. It may or may not be represented in the high school by a group of teachers of a particular subject. The teacher reference group consists of the authoritative and prestigious group in the school whose orientation is teaching and Education rather than a particular subject matter field. With respect to certain values and attitudes these two reference groups are in conflict. Teachers differ in the extent to which they are oriented toward one or the other of the reference groups according to a number of factors.

They tend to be oriented toward the subject matter reference group because of their background of membership in a subject matter-oriented college group, because such an orientation is status enhancing compared to orientation toward the teacher reference group, and because the institutional organization of the high school focuses constant attention upon the subject matter field of teachers.

Teachers tend to be oriented toward the teacher reference group because of a background of membership in an Education-oriented college group, and because the teacher group is the membership group and, as such, is capable of applying sanctions against non-conformity.

Orientation toward the subject matter reference group has effects of administrative significance because of the normative function of the teacher reference group, expressed in such ways as blocking promotional aspirations, and because of the comparative function of the subject matter reference group, which invites comparison of the lot of the teacher with that of his non-teacher subject matter colleagues.

Thirteen specific hypotheses were drawn directly from this theory. They are worded here in terms of Subject Matter Characteristics (SMC) Scores. High SCM Scores purport to indicate orientation toward the subject matter reference groups, low SMC Scores, orientation toward the teacher reference group. The hypotheses are as follows:

1. SMC Scores are higher for teachers of less teaching experience than for those of more teaching experience.
2. SMC Scores are higher for teachers who have more academic training in their subject matter specialty than for those who have less academic training.
3. SMC Scores are higher for teachers who have less training in Education than for those who have more.
4. SMC Scores are relatively high for teachers trained in university subject matter departments and in liberal arts colleges. They are relatively low

for teachers trained in university departments of Education and in teachers colleges.

5. SMC Scores are higher for teachers who prefer teaching assignments in the field of their training than for teachers who prefer assignments in other fields.
6. SMC Scores are higher for teachers with low Tenure Indices than for those with high Tenure Indices. (Tenure Index is years of teaching experience divided by number of schools in which full-time positions have been held.)
7. SMC Scores are higher for teachers with lower Global Satisfaction than for teachers with higher Global Satisfaction.
8. SMC Scores are higher for teachers with lower Social Satisfaction than for teachers with higher Social Satisfaction.
9. SMC Scores are higher for teachers with low Policy Satisfaction than for teachers with higher Policy Satisfaction.
10. SMC Scores are higher for teachers with lower Occupational Satisfaction than for teachers with higher Occupational Satisfaction.
11. SMC Scores are higher for teachers with lower Alternative Employment Perception than for teachers with higher Alternative Employment Perception. (A low score on A.E.P. indicates the perception that equivalent non-teaching job opportunities are plentiful.)
12. SMC Scores are higher for teachers who are higher on Conformity Pressure than for those who are lower on Conformity Pressure. (A high score on Conformity Pressure indicates that the teachers feel considerable pressure from the administration to conform to the school's educational policies.)
13. SMC Scores are higher for teachers whose Effectiveness is rated lower by the principal than for those whose Effectiveness is rated higher.

B. Instrumentation and Methodology

The instruments used to measure the psychological variables were the Edwards Personal Preference Schedule (15 scores), the Allport, Vernon, Lindzey "Study of Values" (16 scores), the Kerlinger Education Scale (1 score), and the Minnesota Teacher Attitude Inventory (1 score). The 23 scores for each teacher yielded by these instruments were the data used for the test of the basic hypothesis that teachers differ in needs, values, and educational attitudes according to their subject matter field. Male and female teachers, separately, were classified into subject matter field groups according to the major field in which they were trained. Tests of differences between the subject matter field groups were then conducted by simple analysis of variance technique on each of the 23 variables in turn.

The variables involved in the thirteen SMC Score hypotheses were measured by three instruments which were specially constructed for this study. The Teacher Background Information Questionnaire provided the necessary data for the variables, Teaching Experience, Academic Training, Education Training, Type of Institution, Assignment Preference, and Tenure Index. In form the instrument was a straight questionnaire soliciting factual information.

The VAC (Variables of Administrative Consequence) Battery provided measures of the following variables:

1. Global Satisfaction—over-all satisfaction with the teaching position.
2. Social Satisfaction—satisfaction with the social relationships existing among the teachers.
3. Policy Satisfaction—satisfaction with the educational policies of the school.
4. Occupational Satisfaction—satisfaction with teaching as an occupation as compared to non-teaching occupations which require similar subject matter training.
5. Alternative Employment Perception—the extent to which a teacher perceives non-teaching job opportunities to be available.
6. Conformity Pressure—the extent to which a teacher feels under pressure to conform to the educational policies of the school.

In form the VAC Battery contained one six-point self-rating scale for each of the six variables. Each rating scale consisted of six graded statements one of which was to be checked.

The Principal-Rated Effectiveness Scale described six levels of teaching effectiveness worded in terms of degrees above and below the average effectiveness of teachers in the particular school. The principal of each school was required to assign to each teacher in his school a number corresponding to one of the levels of the scale.

In the tests of the thirteen specific hypotheses the Subject Matter Characteristics (SMC) Score was used as the measure of the orientation of teachers on a scale, the high end of which represents extreme orientation to the subject matter reference group and the low end of which represents extreme orientation to the teacher reference group. It is based upon the psychological variables which discriminate significantly between the subject matter field groups. In essence it compares the profile of a given teachers on these discriminating variables to two models. The first model is the profile of means of the total group of teachers of the particular sex. The second model is the profile of means of the teacher's subject matter field group. This is considered to be the best representative of the characteristics of the subject matter reference group although its deviations from the first model are diminished because of the confounding presence of teachers in the subject matter field group who are teacher-oriented. The SMC Score, then, is a measure of the extent to which an individual teacher exaggerates the characteristics of the model of his subject matter field group as opposed to the characteristics of the model of teachers in general. This score which was derived specially for this study is as follows:

$$SMC\ Score = \sum_{j=i}^k \frac{(\bar{X}_{Tj} - \bar{X}_{SMj}) (\bar{X}_{SMj} - X_{ij})}{S_{Tj}S_{SMj}}$$

where j = any of the k variables included in the profile.

i = any teacher.

$\bar{X}_{Tj}$ = the mean of the total teacher group on variable j .

$\bar{X}_{SMj}$ = the mean of the subject matter field group on variable j .

S_{Tj} = the standard deviation of the total teacher group on variable j .

S_{MSj} = the standard deviation of the subject matter field group on variable j .

Teachers were divided into two groups, those oriented toward the subject matter reference group and those oriented toward the teacher reference group, by dividing the distribution of SMC Score at the mean. The hypothesized relationships were then tested by forming contingency tables with the two categories of SMC Scores on one dimension and categories of the particular variable in question on the other dimension. The direction of the relationship (hypothesized direction or reverse of hypothesized direction) was noted from the contingency table and the magnitude of the relationship was tested for significance against the Chi-Square distribution.

The theory as a whole was then tested by the Sign Test to determine the significance of its ability to predict the direction of relationships. The test itself requires the assumption of continuity in the distribution of degrees of relationships. This particular application of the test assumes that the relationships are hypothesized *a priori* and that the variables involved in the relationships are independent. These three assumptions are considered to be met.

C. The Sample

The sample of the study consists of 564 teachers and principals who represent approximately the total faculties of eight large high schools. Schools which were invited to participate were located within 150 miles of Chicago, but not inside the Chicago system, and had faculties of 50 or more teachers. The types of communities in which the schools were located varied from primarily residential to primarily industrial and from city suburb to independent town. They were located in three states—Illinois, Indiana, and Wisconsin.

Subject matter field groups which were represented by 10 or fewer teachers were eliminated from the study. The remaining sample was compared on several variables with independent samples to provide some basis of judgment for the degree to which the sample was similar to other groups. In most respects they were found to be similar to the other samples but, as would be expected, there was some bias evident toward their large urban school origin.

D. Results

The subject matter field groups of the male sample were found to differ with respect to AVL (Allport, Vernon, Lindzey) theoretical value (.001 level), AVL economic value (.001 level), AVL aesthetic value (.001 level), AVL political value (.01 level), Edwards n. affiliation (.05 level), Edwards n. change (.05 level), and the single score of the Kerlinger (.05 level). These seven variables plus Edwards n. heterosexuality, which showed differences significant at the .10 level, were used as the basis for the SMC Scores of the male teachers.

The female teachers differed by subject matter field groups on AVL theoretical (.01 level), AVL economic (.001 level), AVL aesthetic (.001 level), AVL political (.001 level), Edwards n. order (.005 level), and Edwards n. exhibition (.05 level). These six variables plus Edwards n. affiliation and Minnesota Teacher

TABLE 1
CHARACTERISTICS OF SUBJECT MATTER FIELD GROUPS
OF MALE TEACHERS ON EIGHT PSYCHOLOGICAL
VARIABLES WHICH DIFFERENTIATE BETWEEN
THE SMF GROUPS*

SMF Group	AVL theoretical†	AVL economic	AVL aesthetic	AVL political	Edwards n. affiliation	Edwards n. change	Edwards n. heterosexuality	Kerlinger
Commerce	L	H	M	H	M	L	L	L
English	L	L	H	M	M	M	H	M
Industrial Arts	H	H	M	M	M	L	L	L
Mathematics	H	M	L	L	H	H	M	L
Physical Educ. .	M	H	L	H	H	M	H	H
Science	H	L	L	M	L	M	M	M
Social Studies ..	M	M	H	H	L	H	M	H
Fine Arts	L	M	H	L	L	H	H	M
Principals	M	L	M	L	H	L	L	H

*On each variable the three highest-ranking SMF groups have been assigned the symbol H, the middle three the symbol M, and the lowest three the symbol L.

†The psychological variables are defined in the Appendix.

TABLE 2
CHARACTERISTICS OF SUBJECT MATTER FIELD
GROUPS OF FEMALE TEACHERS ON EIGHT
PSYCHOLOGICAL VARIABLES WHICH DIFFERENTIATE
BETWEEN THE SMF GROUP*

SMF Group	AVL theoretical†	AVL economic	AVL aesthetic	AVL political	Edwards n. order	Edwards n. exhibition	Edwards n. affiliation	MTAI
Commerce	L	H	L	H	H	L	L	L
English	L	L	H	H	L	M	H	M
Foreign Lang.	L	M	H	M	M	M	L	L
Home Ec.	H	H	L	M	H	L	M	L
Mathematics	H	M	L	L	H	L	M	M
Physical Educ.	M	H	M	M	M	M	M	H
Science	H	L	M	L	L	H	H	H
Social Studies	M	M	M	H	M	H	H	H
Fine Arts	M	L	H	L	L	H	L	M

*On each variable the three highest-ranking SMF groups have been assigned the symbol H, the middle three the symbol M, and the lowest three the symbol L.

†The psychological variables are defined in the Appendix.

Attitude Inventory score, which showed differences significant at the .10 level, formed the basis of the SMC Scores for female teachers.

Tables 1 and 2 indicate the content of the profiles for the various subject matter field groups for men and women teachers.

The tests of the thirteen specific hypotheses for the male sample showed significant relationships in the hypothesized direction between SMC Scores and Education Training (.05 level), Type of Institution (.001 level), Assignment Preference (.05 level), Tenure Index (.05 level), Global Satisfaction (.05 level), and Conformity Pressure (.01 level). Twelve of the thirteen relationships were found to be in the direction hypothesized. The Sign Test indicated that the theory as a whole is efficient in the prediction of the direction of relationships at a confidence level of .002. Two subsidiary tests of the hypotheses for the male sample provided similar results although the magnitudes of the relationships were reduced.

The tests of the thirteen specific hypotheses for the female sample produced inconclusive results. None of the individual relationships was significant. Moreover, the directions of the relationships were not highly consistent. Four were in the direction hypothesized whereas nine were in the reverse direction to that hypothesized. A two-tailed Sign Test indicated that this occurrence was not significant at the .05 level.

E. Conclusions

1. Subject matter groups of male secondary teachers of this sample differ from one another with respect to certain personality needs, dominant values, and educational attitudes. The basic hypothesis of the study, that such differences exist, is thus accepted as it applies to the male teachers.
2. The subject matter field groups of the female sample have been demonstrated to differ significantly on personality needs and upon dominant values. The basic hypothesis of the study, that subject matter field groups differ in personality need, dominant values, and educational attitudes, is therefore, accepted for the female sample with the qualification that differences in educational attitudes were not demonstrated.
3. In its ability to predict the direction of relationships for the male secondary teachers included in this sample the theory is substantiated at the .002 level of confidence.
4. The failure of seven hypothesized relationships for the male sample to reach significance indicates that the theory may not be accepted in its entirety on the basis of the tests of individual hypotheses alone. In view of the efficiency of the theory in predicting the direction of relationships, however, it is considered more likely that errors of measurement are responsible for the lack of significance than that the theory is inadequate.
5. Male high school teachers of this sample who are oriented toward their subject matter reference group compared to those who are oriented toward the teacher reference group:
 - (a) have fewer semester hours of courses in Education.
 - (b) are more often trained in universities, registered in subject matter departments, or in liberal arts colleges than they are in universities, registered in the Education departments or in teachers' colleges.
 - (c) express the preference to teach the subject in which they were trained rather than some other subject.
 - (d) more often move from school to school (as measured by Tenure Index).
 - (e) are lower in over-all satisfaction with their teaching job.
 - (f) feel under more pressure to conform to the educational policies of the school.
6. Differences in personality needs, dominant values, and educational attitudes which have been shown to exist between the different subject matter field groups of male secondary teachers have also been shown to be of more than theoretical interest to the study of administration. Through the medium of the theory these differences have been shown to be related to variables which are eminently important to the study of administration and to the actual operation of schools. The specific variables referred to are Tenure Index, Global Satisfaction, and Conformity Pressure.

7. For the female sample, the thirteen hypothesized relationships did not prove to be significant individually. Nor were they consistent in direction collectively.
8. The hypotheses applied to the female sample were those originally derived for males. A re-examination of the differences in social context for male and female teachers suggests that the inconclusive results of the tests of the hypotheses for females may be explained in terms consistent with the theory. The context for female teachers is seen to differ from that for males in that for females teaching is a relatively high prestige occupation, females are not as vulnerable to the threat of promotional sanctions as are males, and for many females teaching is a secondary occupation to marriage. Application of the theory to this newly conceived female context indicates that both reference groups would be expected to become relatively impotent. Under these circumstances the tests of the hypotheses would be expected to be inconclusive. This explanation, stemming as it does from a *posteriori* reasoning, may be advanced not as a finding of this study but as an hypothesis which requires independent verification.

F. *Implications for the Field of Administration*

1. In the interests of increasing common purpose among the personnel of schools great emphasis has been placed upon so-called "democratic" administration and the general human relations approach to administration. Any of the means used, however, must be based upon a sound knowledge of the phenomenon which it is intended to develop. The phenomenon is voluntary agreement with and willingness to pursue certain purposes. This is essentially a problem of personality needs, values, attitudes, motives, and the like. It is at this point that the study is considered to make its greatest contribution to the study of administration. It has discovered groupings of teachers whose need, value, and attitude structures are relatively homogeneous and has indicated areas of basic differences. It has further contributed to knowledge of certain kinds of social behavior which is important to the operation of schools. In so doing it is considered to have contributed to an understanding of the factors involved in increasing shared or common purpose.
2. The differences in basic social psychological variables which have been shown to exist as between teachers of different subject matter fields and between male and female teachers cast considerable doubt upon the validity of assuming that teachers form a homogeneous occupational group. This study is seen to support the contention, then, of those who see the investigation of differences between teachers as more useful at the present stage of research in education than attempts to draw generalizations which pertain to all teachers. When more is known of the differences it will be more apparent which factors require control in the derivation of generalizations.
3. The question of the relative desirability of orientation of a teacher toward the subject matter reference group or towards the teacher reference group is not answered by this study. For female teachers it appears to make little difference. Depending upon one's view of Education the subject matter-oriented male teachers may be looked upon as the victims of an anti-intellectual atmosphere in our schools or as teachers who, in their preoccupation with their own subject matter specialty, do not have a grasp of the total educational process. In either case the findings raise real problems for those concerned with teacher education. Those male teachers who are trained in subject matter-oriented institutions and who have relatively few courses in Education have been shown to be inclined to orient themselves toward the subject matter reference group. If such orientation is considered to be un-

desirable some change may be indicated in this route to the teaching profession. If it is considered to be desirable some change may be indicated in the social context of teachers in the schools.

APPENDIX

Definitions of the Psychological Variables referred to in Tables 1 and 2.

AVL theoretical value—The dominant interest of the theoretical man is the discovery of truth. In the pursuit of this goal he characteristically takes a "cognitive" attitude, one that looks for identities and differences; one that divests itself of judgments regarding the beauty or utility of objects; and seeks only to observe and to reason. Since the interests of the theoretical man are empirical, critical, and rational, he is necessarily an intellectualist.

AVL economic value—The economic man is characteristically interested in what is useful.

AVL aesthetic value—The aesthetic man sees his highest value in *form* and *harmony*. He regards life as a process of events; each single impression is enjoyed for its own sake. He need not be a creative artist; he is aesthetic if he finds his chief interest in the artistic episodes of life.

AVL political—The political man is interested primarily in *power*. His activities are not necessarily confined to the narrow field of politics but leaders in any field generally have a high political value.

Edwards order—Order is the need to have written work neat and organized, to make plans before starting on a difficult task, to have things organized, and the like.

Edwards exhibition—Exhibition is the need to say witty and clever things, to talk about personal adventures and experiences, to say things just to see what effect it will have upon others, to ask questions that cannot be answered, to be the center of attention, and the like.

Edwards affiliation—Affiliation is the need to be loyal to friends, to participate in friendly groups, and the like.

Edwards change—Change is the need to do new and different things, to experience novelty and change in daily routine, to experiment and try new things, and the like.

Edwards heterosexuality—Heterosexuality is the need to go out with members of the opposite sex, to engage in social activities with members of the opposite sex, and the like.

Kerlinger Education Scale—A high score indicates a tendency toward progressivism in educational attitudes. A low score indicates a tendency toward traditionalism.

MTAI—The Minnesota Teacher Attitude Inventory measures the attitudes of teachers toward pupils. A high score indicates those attitudes which are commonly known as progressive. A low score indicates those attitudes which are commonly known as traditional.

TRENDS AND PROBLEMS IN EDUCATIONAL RESEARCH

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Introduction

In the spring of 1957 the British Dominions and Colonies Program of the Carnegie Corporation of New York awarded the writer a travel grant to study educational research along the eastern seaboard of the United States. The ten week trip included visits ranging from half a day to a week, to public and private universities, city school systems, a State Department of Education, and private organizations engaged in educational research. Three weeks were spent in the Southeast region and seven weeks in the Northeast. No attempt was made to secure a representative sampling of organizations and institutions engaged in research. Rather, the attempt was to select a few and, if possible, to spend enough time to become reasonably familiar with their work. On this basis, these organizations and institutions were visited in the Southeast: Florida State University, University of Florida, University of Miami, Atlantic City School System, Southern Regional Educational Board, Alabama Polytechnic Institute, University of Atlanta, University of Georgia, Vanderbilt University, George Peabody College for Teachers, and University of Kentucky. The corresponding organizations and institutions for the Northeast were: Harvard University, Boston University, National Education Association, American Council on Education, the U.S. Office of Education, Educational Testing Service, Princeton University, Teachers College, four Research Bureaus of New York City, Bureau of Educational Research of the New York State Department, Psychological Corporation.

The actual conduct of the visit to any organization or institution originated with a letter stating the writer's interests in educational research, which were broad. These interests included: programs of research; coordination of research; interdisciplinary approaches; graduate student research and its relation to the foregoing; staff research; nature of research (pure vs, applied, action research, etc.); research methodology; use of machines; publication of research; organization, administration, and financing of research; agencies or research bureaus, institutes, etc.). The organization or institution then, in most instances, suggested persons who would be seen. Thus in Universities the writer was directed either to the Department of Psychology or to the School of Education and from there

to the various departments. In organizations, he was invariably directed to the research department, for example, the Research Division of the NEA, the Research and Statistical Branch of the U.S. Office of Education, the Research Division of E.T.S. In every instance, the actual conduct of a visit consisted largely in interviews ranging from half an hour to two hours with persons connected with research. Roughly two hundred persons were interviewed.

It should be noted that the writer's own bias was toward experimental research. However, in visiting an organization or institution, he tried to avoid forcing a pattern or mould onto its work. To the frequent question, "What are you looking for?" or "How can I help you?" the writer replied, "I am interested in educational research. What are you doing?" or "Tell me about your work." If there were no program of research or coordinated research, he looked for staff research; then graduate student research; then institutional research (on admissions and the relation of admissions to subsequent college success); then action research, or the survey or field service types of research; then service organizations such as reading clinics which frequently gather data suitable for research.

The writer would like to express gratitude to the Carnegie corporation for making this trip possible and to the many persons whose kindness and consideration made it so worthwhile.

Trends in Educational Research

Specialization Forty years ago, educational psychology could encompass educational research. Since then psychology has become differentiated into such areas as clinical, experimental, counselling, industrial, social, and the like. In addition, sociology, anthropology, group dynamics, communication and similar disciplines are doing research which can well apply to education. The problems raised by the trend toward specialization include an increasing reliance by educators on other disciplines doing the training of research workers for education. Education, as such, appears to be producing very few persons trained as research workers (the traditional Ph.D.). Another problem, concomitant with the disappearance of educational psychology as the research medium for education, is the neglect of research in the psychology of the school subjects. Except for reading, how children learn the school subjects has been relatively neglected. A final consequence of specialization is the increasing need for interdisciplinary studies in broad areas.

Complexity Today's research worker has to master so many skills — in design, statistics, mathematical models, machine use, and the like — that the task of learning them looms large. Most professors acknowledge that the Ph.D. is an incomplete learning ex-

perience and that it takes another five years of research to have anything like mastery of the complex techniques of modern research. This raises the question of the utility of doctoral candidates on research teams. "It eats up half of your grant," said the head of one institute of research, "to train them into a research team." Perhaps worthwhile research can best be done by teams of experienced researchers. Such teams are uncommon in Universities.

Magnitude Worthwhile research increasingly involves larger numbers of subjects, greater cost, and the like. For example, between 1930 and 1937 the Stanford-Binet was revised and re-normed by Terman working from Stanford University. Between 1950 and 1955 the Wechsler Bellevue was re-normed by Psychological Corporation. Increased financial costs and large resources of trained research teams are inevitable in the trend toward increased magnitude of research projects.

Dispersion Forty years ago educational research was located in Universities. Now it occurs at Airforce bases, in organizations like E.T.S., in government agencies like the U.S. Employment Service of the Department of Labour, in City and State Department research bureaus, and the like. New trends are foreshadowed. Will these agencies publicize their research findings through the traditional channels (journals) or will their own technical publications become a new medium of communication? Will these research agencies more satisfactorily solve the coordination and financing of research, and so take over some of the more significant and large scale research from the Universities? Signs of both of these new trends can be perceived.

Problems in Communication

It is axiomatic in science that a researcher builds upon preceding research, and that the researches of one man fructify and stimulate the work of others. This "building block" concept of the growth of scientific knowledge is obviously based on communication. One of the problems of communication is from the research worker to the ultimate user of the research: the principal, teachers, curriculum coordinator, etc. Douglas Scates (University of Florida) suggests that many levels of interpretation are required. Thus, the language of the mathematical statistician, the "model constructor", or of the factor analyst must be translated for research users not expert in these fields. At a different level, the language of the special disciplines such as sociology or clinical psychology must be translated into terms usable by the curriculum maker. This task is currently done by text book writers, and by a host of pamphleteers. Yet, over and over, one hears the remark by University professors that "school

practice is lagging at least thirty years behind solidly verified research findings."

An omnipresent problem of communication is publication. This has many forms. In research bureaus (such as E.T.S., or the New York City Schools Educational Research Bureau) it was commonly observed that jobs were prescribed, prepared for presentation to interested parties, but no report made public. Again, many researchers complained of the length of time between acceptance of a paper and its publication, of the cost of reprints, and the like.. Librarians were perplexed with the increasing number of journals and with attendant problems of cost and shelf space. Some University professors complained about the straight-jacket policies of editors in prescribing length of article and format.

A still more frustrating problem is that of classification and indexing. An article on learning may be found in the *Journal of Orthopsychiatry* or in the *American Journal of Sociology*, or in any of a number of other journals. Several persons complained about existing indexes, such as *Psychological Abstracts*, on the score that they were too condensed, without adequate cross-reference. This was compared with the index of *Chemical Abstracts* which averages five or six cross-references. *Education Index* was considered adequate for its limited coverage.

A closely allied problem most frequently mentioned was "keeping up with the literature." R. L. Thorndike spoke for many when he said, "As the years go by one gets more and more discouraged by one's attempts to keep up with the literature in a subject", and he pointed to two stacks of journals, mimeographed reports, etc., literally two feet high. This problem is of course related to more and more publication, and to classification or selection of what one needs to read. Mr. Ian MacDonald's recent inquiry into this matter will be of interest.¹

The most difficult problem of all in communication is to find out what other researchers are projecting for the future or are doing at present. Published research papers generally tell what colleagues were doing three or four years ago. Personal communications, visits during conventions, and other informal contacts appear to be the only occasions for communication about on-going research.

In one type of research, however, concealment is the rule. This is institutional research relating to admissions. Freshman average scores, cut-off points, and relation of these to subsequent college success, are frequently closely guarded secrets. Every university

¹Ian C. MacDonald, "Educational Import of Growth of Learning," *Alberta Journal of Educational Research*, (March, 1957), pp. 6-23.

it appears does more or less of this type of research, but seldom publishes results.

So much for problems and trends in communication. Were there any solutions? One solution for the gap between school practice and verified research findings is the interpretive job of intermediaries like text book and pamphlet writers. A different solution is action research. The Horace Mann-Lincoln Institute of School Experimentation (Teachers College) has income from an endowment, a staff of fifteen to twenty (half full-time associates and half part-time research assistants), and is dedicated to research conducted in field laboratories. In the words of Dean Corey, "To the extent that the cooperating researchers in the associated schools merely collect data, not many changes take place in the school system. To the extent that they go beyond this (analyze the problem, set up hypotheses, plan changes in practice, collect data on changes, etc.) then real changes take place in the school system". The scientific researcher traditionally collects data from the school system, analyzes it, and presents an article, monograph, or book. Then he complains that practice has not changed. People who have tried to change practice say that the method which works is action research.

A reasonably satisfactory solution to the annoying journal article references to "Unpublished Doctoral Dissertation" is *Abstracts of Dissertations and Monographs in Microfilm*, University Microfilms, 313 North First Street, Ann Arbor, Michigan. The abstracts cover dissertations in all subjects, are published monthly at an annual subscription of \$16.00, are adequate in education and psychology (2,000 to 2,500 words), cover the major universities in the U.S.A., and are backed up by the microfilm of the dissertation for sale or rent.

Many solutions to the classification and indexing problems were suggested. One is to do for many subjects something similar to George Geothal's (Harvard University) work for Mental Health in Education. He has developed an exhaustive classification system. Articles are read, abstracted, and classified on this system. McBee keysorts cards can readily be used. A modification not involving abstracting can be attributed to David Saunders (E.T.S.). This would involve an organization or agency with a staff (Why not the A.C.E., foundation-supported?) which would classify articles sent by the journals as soon as they were set up in print. The article would be placed on a microfilm. The harassed professor could then have a standing order for all articles in certain classifications. This solution would leave the journals intact for professors who dislike micro-cards, who like marginal notes, and so on. Also, it avoids the difficulty of abstracting and the questionable practice

of the author doing his own abstract. It would permit multiple classification of any one article, and should not create trouble with current editorial boards and publishers.

The writer was informed that the Bio-Sciences Information Exchange of the Smithsonian Institute (113 Dupont Circle building, Washington D.C.) provides a communication service for research in the biological, medical, and psychological sciences. The major governmental grant-awarding agencies, and the foundations have agreed to file progress reports on research. Its services are free to granting agencies and investigators associated with recognized research institutions. The writer was informed (but not by the Smithsonian Institute) that by writing to the Institute it is possible to obtain information on current research in a *specific* area.

One rather cynical view expressed by a sociologist disposed of the current research communication problem neatly but viciously. This view was that the first rate researchers knew what the other first rate persons in the field were doing, and that the second raters didn't matter. Cynicism apart, this returns us to *levels* of communication. The giants in the field want to know problems and findings, while the less experienced want to know methods and techniques. Problems and findings require little space, but methods and techniques much.

Problems in Coordination

To what extent is research best done by the researcher working alone and unhampered, or at the other extreme, having a small assigned part in a large planned research program? On this issue many and diverse opinions might be quoted. With reference to graduate students, Philip Vernon (University of London) indicated that doctoral candidates were often "left pretty much on their own" at London Institute of Education. R. Kropp (Florida State University) and many others considered much of the value of graduate research to be a learning experience, the search for the problem, for example. Wm. Kvaraceus (Boston University), who is used to an interdisciplinary team approach and community studies, considered that the fact that a graduate student approached a professor indicated choice of an area and willingness to accept direction in that area. The same diversity of views can be found for staff research. "Creatively is an individual matter" is contrasted with the "interdisciplinary team approach", and of course all manner of intermediate positions can be identified, as follows.

Level I — Interdisciplinary team of professional equals with at least five years experience.

Level II — Team of equals, experienced as above, from various sub-disciplines within one discipline.

Level III — One experienced researcher and a group of new Ph.D. graduates.

Level IV — One experienced researcher and a group of Ph.D. candidates.

With respect to graduate student research, one finds variations from the "alone and unhampered" to the "small assigned part in a large planned research program". For example, at Harvard University (and elsewhere), the occasional strong-minded student selects a research area not necessarily close to the interests of his major advisor, and as a result is "left pretty much on his own". In many universities, the student works close to the advisor's area of interest, as for example Boston University, where the aspiring doctoral student must first be accepted by an advisor before he can become a candidate. A most common pattern is to find a cluster of graduate students working with one professor in his area of interest. Thus, Donald Super's (Teacher College) project in "Career Choices" has ten dissertations completed and fifteen ongoing. Coordination is evident where several professors are working in an area (for example Durrell, Murphy, Crosley, Noel, of Boston University reading clinic) and graduate students interested in the area carry out parts of a coordinated program. A possibly more difficult level of coordination is found where several professors from different disciplines conduct an extended research program. This was illustrated by the University of Florida studies in administration and supervision, where such men as Wiles (administration), Combs (psychology), Scates (research) and others met regularly as a team with graduate students to conduct a research program, which has produced some twenty doctoral dissertations over a period of four years.

Coordination of research at the staff level involves the three problems which underlie the above discussion. One is a question of *values*. . . Must the researcher be "free"? Can creativity be "directed"? Is imaginative research an "individual" matter? Scraps of evidence can be cited. I gather from directors of research bureaus that they would subscribe to no extremes. Such men as Herbert Conrad (Research and Statistical Department of U.S. Office of Education), Henry Dyer (Vice President in charge of research for E.T.S.), or J. Wayne Wrightstone (New York Schools Educational Research Bureau) would probably subscribe to the view that a research minded man, interested in an area, will do effective work in the area if the problem is assigned, but he works out the design and conduct of the study with his research team. Those who disagree

with this proposition (and the writer met some researchers who would) should note the large number of researchers who have become interested in mental deficiency since study of it has received large scale financial support. However, if the staff member believes that creativity is necessarily highly individualized and is stifled by group effort, he will likely avoid team research, unless (perhaps) he directs the team. In addition to the problem of values, coordination of research requires *finances*, which problem warrants a more extended discussion in the next section of this paper. The third problem in coordination is one of *human relations*. How can staff members learn to work together? Interestingly enough, Deans and Department heads can see this problem while staff members cannot (or do not). It is no accident, in the writer's view, that the best examples of coordinated research he saw in universities occurred in the field of administration and supervision, in institutions which stressed improved human relations as part of the training program in this area.

Considering the above problems of coordination, it is little wonder that in the universities visited, research bureaus, or any organized effort to coordinate educational research, were rare. If they existed they had modest aims which did not include the coordination of research above Level IV. Harvard University has a "Laboratory of Research in Instruction" headed by J. B. Carroll; Florida State University would like to start a "Bureau of Educational Research" (Kropp and Curtis); the University of Florida had one, it died, and Dean J. B. White rather wishes it were back in existence. Teachers College has the "Institute of Psychological Research" headed by Irving Lorge. The modest aims of such organizations are (1) a centre, a building, a haven, where research activities can be housed (function-space), (2) a staff of perhaps one professor full time, or some professors assigned part time to research, and clerical help, and perhaps technical (machine operator) assistance (function — to allocate man hours to research), (3) a presige factor in securing grants or charging for services (function-finance), (4) a place where those interested in research might meet and talk (function-to communicate). While some coordination may result from the above, it is a far cry from the kind of coordination necessary for large-scale break-throughs in educational research.

Coordinated research at Levels I and II is done by organizations such as E.T.S. and Educational Research Bureau, New York City Schools. Interestingly enough, while this solves the coordination problem, thus drawing on the time, experience, and specialization of a team, it raises new problems. One of these is "mandated" or required research continually intruding on ongoing research or even

pushing it aside. Another is the "frustration of creativity" if the foregoing occurs too frequently. However, the writer is impressed by the team approach at these levels, and believes that large-scale break-throughs on such problems as the learning of mathematics through the grades, or motivation for learning in the secondary school, require this team approach. The writer found only one such team approach in a University, namely, the previously mentioned Horace Mann-Lincoln Institute for School Experimentation (Teachers College). Will the function of coordinated research be taken over by organizations such as E.T.S., Psychological Corporation, or city Research Bureaus?

Problems in Finance

Large scale educational research of the kind which really pushes back the frontier of knowledge in a major "break through" is costly. This does not mean that costly research is necessarily good; nor that good research (especially on theoretical constructs) is costly.

The most frequent answer I got when I asked a University professor to tell about his research was the apologetic, "Well, I'm not doing as much as I should" or still more apologetic, "I know I should be doing some research but I just haven't time". Class load, administrative (committee) work, and graduate students take up so much time that the professor cannot do research. How much this is a rationalization and an acknowledgment of a stereotype that the professor is a researcher, is difficult to determine. It is quite likely that some people frankly prefer teaching, working with graduate students, and writing, but unlike Lawrence Shaffer (Teachers College) do not openly say so. However, when one starts getting facts: numbers of hours teaching per week, number of active graduate students, kind and role of committees, then one agrees that in many cases research could only be carried out on stolen time. This appears to be a universal problem — as J. B. Carroll (Harvard) puts it, "there needs to be more than 24 hours in the day."

Another persistent finding is that graduate students are frequently part-time, which hinders research at this level. Coupled with this is the paucity in number and amount of scholarships, fellowships, assistanceships, or whatever name is attached to subsidized higher education, which would permit of intramural studies.

Common, too, is staff dissatisfaction with the salary level. This may be irrelevant to research, or it may motivate extended research to develop eminence and a move to a higher paying job. However, low salaries are likely to encourage a non-research type of money earning activity such as consulting, speaking, writing, and the like.

It is an eye-opener to visit a number of University campuses and inquire the whereabouts of the Department of Psychology. The most frequent answers are, "In the basement of" or "In the temporary buildings (i.e. old army huts)". This problem of space at a time of increasing enrollment is universal, but space is required to do research. Especially lacking is any sort of office space for graduate assistants.

Machine processing of data, and statistical analysis by machines, can revolutionize research (at a price). Any institution which can afford a machine installation can do work which was not dreamed of before. Ask any machine man, and he will tell you (in the words of Philip Rulon of Harvard) that machines are here to stay. He will also agree with John Alman (Boston University Office of Statistical and Research Services) that a bare minimum installation would cost \$500 a month machine rental and an equal amount for salaries and overhead. An adequate installation would cost very much more.

Research itself costs money. It appears obvious that if each staff member were to spend half his time on research, the institution should double its staff. Space, clerical assistance, materials, consulting service, library, use of machines, and other incidentals add up to an impressive total.

These are indicative of the problems of finance in university research. What are the solutions one sees? The most common were grants for "research projects", such as those awarded by the U.S. Office of Education, the National Institute for Mental Health, and various foundations. The largest grant of this sort the writer encountered was for Teachers College (Maurice Fouracre) Mental Retardation Project (\$66,000); but far more typical was the \$20,000 grant. Such grants are awarded on the basis of soundness of design, significance for education, and adequacy of facilities and personnel, in that order.

It is obvious that this solution to financial problems of educational research may raise a new problem, viz., that the areas of research may be determined by granting bodies. This is, in fact, the case. Governmental agencies were directed by law to allocate certain portions of the grants to certain areas. Notably, one finds a large number of research projects on mental deficiency. Another new problem is the use of the researcher's time in securing such grants, and in administering them after they are secured.

A second solution to the problem of financing educational research is unique to the institution, and is some arrangement for supporting educational research directly. Such financial backing is

usually pitifully small. One good example is the University of Georgia's research fund, administered by the School of Graduate Studies. Any staff member may apply through his Dean for a research grant, which may, for example, free him one third time for research work. Such limited financial support for educational research is probably as extensive in universities as it is relatively ineffective.

A third unique solution for financing educational research is the endowed research institute at Teachers College. It has funds, a staff, and a program. It seeks to do cooperative applied research with school systems, which involves the school system in the research.

It is obvious that there are no adequate and far-reaching solutions for the financial problems of educational research. The limited financial support given to higher education in our society has to be divided among buildings, salaries, scholarships, and research. Another division has to be by major disciplines: medicine, law, engineering, liberal arts, education, etc. (One Dean of Education remarked about the University in which the School of Education annually made a "profit" of half a million dollars which supported the Medical School). These divisions probably reflect basic value-judgements in our society.

Summary

As a result of a ten week observation of educational research in various institutions and organizations along the Eastern seaboard of the U.S.A., the writer has presented his impressions about trends and problems. The trends noted were increased *specialization*, *complexity*, *magnitude*, and *dispersion*. Each of these trends raised problems in educational research. The major problems of educational research as viewed by the author were *communication*, (including publication, indexing and classification, keeping up with the literature, and keeping up with current or on-going research); *coordination* (which involved levels in terms of experience or skill, and in terms of variety of disciplines represented, and also involved values, finances, and human relations); and *finances* (which include staff load, subsidized higher education for students, space, machines, equipment, etc.). Where solutions to these problems were evident, they were described; and beyond that forecasts were made or questions raised about future trends.

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